

**WHAT IS CLAIMED IS:**

1           1.     A method of providing select mask for a hierarchical instruction  
2     dependency scoreboard comprising:  
3           generating a first plurality of select masks for a first plurality of instructions  
4           immediately preceding a group of instructions; and  
5           selecting a second plurality of select masks from said first plurality of select  
6           masks using a write pointer.

1           2.     The method of claim 1, further comprising:  
2     fetching said group of instructions.

1           3.     The method of claim 1, wherein said write pointer identifies a current  
2     instruction from said group of instructions.

1           4.     The method of claim 1, wherein said group includes at least eight  
2     instructions.

1           5.     The method of claim 4, wherein said group of instructions is mod eight  
2     rotated.

1           6.     The method of claim 1, wherein said hierarchical instruction  
2     dependency scoreboard tracks one or more dependencies of said group of instructions  
3     on one or more of said instructions immediately preceding said group of instructions.

1           7.     The method of claim 1, wherein said hierarchical instruction  
2     dependency scoreboard tracks said dependencies for 128 instructions.

1           8.     The method of claim 1, wherein said said hierarchical instruction  
2     dependency scoreboard tracks said dependencies of said instructions on said first  
3     plurality of instructions immediately preceding said group of instructions.

1           9.     The method of claim 1, wherein said hierarchical instruction  
2     dependency scoreboard comprises a fast dependency scoreboard.

10091383-030600

1           10.     The method of claim 9, wherein said fast dependency scoreboard  
2 tracks said dependencies of said group of instructions on at least 32 instructions  
3 immediately preceding said group of instructions.

1           11.     The method of claim 1, wherein said hierarchical instruction  
2 dependency scoreboard further comprises a slow dependency scoreboard.

1           12.     The method of claim 11, wherein said slow dependency scoreboard  
2 tracks said dependencies of said group of instructions on at least 128 instructions  
3 immediately preceding said group of instructions.

1           13.     The method of claim 1, wherein said instructions in said hierarchical  
2 instruction dependency scoreboard are organized in a plurality of octets using an  
3 instruction identification of each one of said instructions.

1           14.     The method of claim 13, wherein said hierarchical instruction  
2 dependency scoreboard is a single strand hierarchical instruction dependency  
3 scoreboard.

1           15.     The method of claim 13, wherein said hierarchical instruction  
2 dependency scoreboard is a multi-strand hierarchical instruction dependency  
3 scoreboard.

1           16.     The method of claim 1, wherein said first plurality of select masks is  
2 generated using a predetermined truth table.

1           17.     The method of claim 16, wherein said truth table identifies a select  
2 mask for first instruction of each one of said plurality of octets.

1 18. The method of claim 2, further comprising:  
2 determining a current octet for said current instruction;  
3 selecting a select mask for a first instruction of said current octet from said  
4 truth table;  
5 generating a first group of select masks for each instruction in said current  
6 octet;  
7 determining whether one of said group of instructions belong to a next octet;  
8 if said one of said group of instructions belong to a next octet,  
9 selecting a select mask for a first instruction of said next octet from  
10 said truth table,  
11 generating a second group of select masks for each instruction in said  
12 next octet,  
13 selecting said second plurality of select masks using said write pointer  
14 from said first and second groups of select masks.

1 19. The method of claim 18, further comprising:  
2 receiving one or more of said dependencies of said group of instructions.

1 20. The method of claim 19, further comprising:  
2 populating said dependencies in said slow dependency scoreboard.

1 21. The method of claim 15, further comprising:  
2 selecting a first group of dependencies from said dependencies using said  
3 second plurality of select masks.

22. The method of claim 21, further comprising:  
determining whether populating said first group of dependencies in said fast  
dependency scoreboard require a wrap-around;  
if populating said first group of dependencies in said fast dependency  
scoreboard require a wrap-around,  
identifying one or more of said dependencies that require wrap-around  
from said first group of dependencies,  
deleting said dependencies that require wrap-around from said first  
group of dependencies, and  
populating remaining dependencies from said first group of  
dependencies in said fast dependency scoreboard.

23. A select mask generation system comprising:  
a dependency select logic;  
a fast dependency scoreboard coupled to said dependency select logic,  
wherein said dependency select logic is configured to  
generate a first plurality of select masks for a first plurality of  
instructions immediately preceding a group of instructions; and  
select a second plurality of select masks from said first plurality of  
select masks using a write pointer.

24. The system of claim 23, wherein said fast dependency scoreboard is  
configured to track dependencies of a plurality of instructions on at least 32  
instructions immediately preceding said plurality of instructions.

25. The system of claim 23, further comprising:  
a slow dependency scoreboard coupled to said dependency select logic,  
wherein said slow dependency scoreboard is configured to track said  
dependencies of said plurality of instructions on at least 128  
instructions immediately preceding said plurality of instructions.

1        26.    The system of claim 23, further comprising:  
2        an instruction picker unit coupled to said fast dependency scoreboard, wherein  
3        said instruction picker is configured to select an instruction that is  
4        ready for execution.

1        27.    The system of claim 26, wherein said instruction that is ready for  
2        execution do not have said dependencies.

1        28.    The system of claim 26, wherein said instruction picker is coupled to  
2        said slow dependency scoreboard.

1        29.    The system of claim 26, wherein an out of order processor comprises  
2        said select mask generation system.

1        30.    The system of claim 23, wherein said dependency select logic is  
2        further configured to  
3        determine a current octet for said current instruction;  
4        select a select mask for a first instruction of said current octet from said truth  
5        table;  
6        generate a first group of select masks for each instruction in said current octet;  
7        determine whether one of said group of instructions belong to a next octet;  
8        if said one of said group of instructions belong to a next octet;  
9        select a select mask for a first instruction of said next octet from said  
10        truth table;  
11        generate a second group of select masks for each instruction in said  
12        next octet;  
13        select said second plurality of select masks using said write pointer  
14        from said first and second groups of select masks.

1        31.    The system of claim 30, wherein said dependency select logic is  
2        further configured to  
3        receive one or more of said dependencies of said group of instructions.

1           32.     The system of claim 31, wherein said dependency select logic is  
2 further configured to  
3           populate said dependencies in said slow dependency scoreboard.

1           33.     The system of claim 32, wherein said dependency select logic is  
2 further configured to  
3           select a first group of dependencies from said dependencies using said second  
4           plurality of select masks.

1           34.     The system of claim 33, wherein said dependency select logic is  
2 further configured to  
3           determine whether populating said first group of dependencies in said fast  
4           dependency scoreboard require a wrap-around;  
5           if populating said first group of dependencies in said fast dependency  
6           scoreboard require a wrap-around,  
7           identify one or more of said dependencies that require wrap-around  
8           from said first group of dependencies;  
9           delete said dependencies that require wrap-around from said first group  
10          of dependencies; and  
11          populate remaining dependencies from said first group of dependencies  
12          in said fast dependency scoreboard.

1           35.     A system for providing select mask for a hierarchical instruction  
2 dependency scoreboard comprising:  
3           means for generating a first plurality of select masks for a first plurality of  
4           instructions immediately preceding a group of instructions; and  
5           means for selecting a second plurality of select masks from said first plurality  
6           of select masks using a write pointer.

1           36.     The system of claim 35, further comprising:  
2           means for fetching said group of instructions.

1           37.     The system of claim 35, wherein said write pointer identifies a current  
2 instruction from said group of instructions.

1           38.     The system of claim 35, wherein said group includes at least eight  
2 instructions.

1           39.     The system of claim 38, wherein said group of instructions is mod  
2 eight rotated.

1           40.     The system of claim 35, wherein said hierarchical instruction  
2 dependency scoreboard tracks one or more dependencies of said group of instructions  
3 on one or more of said instructions immediately preceding said group of instructions.

1           41.     The system of claim 35, wherein said hierarchical instruction  
2 dependency scoreboard tracks said dependencies for 128 instructions.

1           42.     The system of claim 35, wherein said hierarchical instruction  
2 dependency scoreboard tracks said dependencies of said instructions on said first  
3 plurality of instructions immediately preceding said group of instructions.

1           43.     The system of claim 35, wherein said hierarchical instruction  
2 dependency scoreboard comprises a fast dependency scoreboard.

1           44.     The system of claim 43, wherein said fast dependency scoreboard  
2 tracks said dependencies of said group of instructions on at least 32 instructions  
3 immediately preceding said group of instructions.

1           45.     The system of claim 35, wherein said hierarchical instruction  
2 dependency scoreboard further comprises a slow dependency scoreboard.

1           46.     The system of claim 45, wherein said slow dependency scoreboard  
2 tracks said dependencies of said group of instructions on at least 128 instructions  
3 immediately preceding said group of instructions.

1           47.     The system of claim 35, wherein said instructions in said hierarchical  
2 instruction dependency scoreboard are organized in a plurality of octets using an  
3 instruction identification of each one of said instructions.

1           48.     The system of claim 47, wherein said hierarchical instruction  
2 dependency scoreboard is a single strand hierarchical instruction dependency  
3 scoreboard.

1           49.     The system of claim 47, wherein said hierarchical instruction  
2 dependency scoreboard is a multi-strand hierarchical instruction dependency  
3 scoreboard.

1           50.     The system of claim 35, wherein said first plurality of select masks is  
2 generated using a predetermined truth table.

1           51.     The system of claim 50, wherein said truth table identifies a select  
2 mask for first instruction of each one of said plurality of octets.

1           52.     The system of claim 36, further comprising:  
2 means for determining a current octet for said current instruction;  
3 means for selecting a select mask for a first instruction of said current octet  
4 from said truth table;  
5 means for generating a first group of select masks for each instruction in said  
6 current octet;  
7 means for determining whether one of said group of instructions belong to a  
8 next octet;  
9 means for selecting a select mask for a first instruction of said next octet from  
10 said truth table if said one of said group of instructions belong to a next  
11 octet;  
12 means for generating a second group of select masks for each instruction in  
13 said next octet if said one of said group of instructions belong to a next  
14 octet;



means for selecting said second plurality of select masks using said write pointer from said first and second groups of select masks if said one of said group of instructions belong to a next octet.

53. The system of claim 52, further comprising:  
means for receiving one or more of said dependencies of said group of instructions.

54. The system of claim 53, further comprising:  
means for populating said dependencies in said slow dependency scoreboard.

55. The system of claim 54, further comprising:  
means for selecting a first group of dependencies from said dependencies using said second plurality of select masks.

56. The system of claim 55, further comprising:  
means for determining whether populating said first group of dependencies in said fast dependency scoreboard require a wrap-around;  
means for identifying one or more of said dependencies that require wrap-around from said first group of dependencies if populating said first group of dependencies in said fast dependency scoreboard require a wrap-around;  
means for deleting said dependencies that require wrap-around from said first group of dependencies if populating said first group of dependencies in said fast dependency scoreboard require a wrap-around; and  
means for populating remaining dependencies from said first group of dependencies in said fast dependency scoreboard if populating said first group of dependencies in said fast dependency scoreboard require a wrap-around.